

What Is Claimed Is:

1. A sensor element (10), having a layer configuration, for detecting a physical property of a gas, in particular for detecting the concentration of a gas component in an exhaust gas of an internal combustion engine, comprising a measuring device (22) used for detecting a physical property of the gas, and comprising a heating device (21) having a heater (30), which is electrically connected to a first heater supply lead (31) and a second heater supply lead (32),

wherein the first heater supply lead (31) is arranged in a plane of stratification between the second heater supply lead (32) and the measuring device (22) and the first heater supply lead (31) is at an at least largely constant electrical potential.

2. The sensor element as recited in Claim 1, wherein the first heater supply lead (31) is insulated from the second heater supply lead (32) by a first insulation layer (41) and the heater (30) has a contact point (45) via which the heater (30) is electrically connected to the first or the second heater supply lead (31, 32), the first insulation layer (41) having a recess in the region of the contact point (45).

3. The sensor element as recited in Claim 1 or 2, wherein the heater (30) and/or the second heater supply lead (32) are/is electrically insulated from a carrier foil (20) by a second insulation layer (42), and the heater (30) and/or the first heater supply lead (31) are/is electrically insulated from the measuring device (22) by a third insulation layer (43).

4. The sensor element as recited in one of the preceding

claims,
wherein the heater (30), the first and the second heater supply lead (31, 32) and the insulation layers (41, 42, 43) are applied onto a carrier foil (20) using screen printing.

5. The sensor element as recited in Claim 1, wherein an insulation foil (44) is arranged between the first heater supply lead (31) and the second heater supply lead (32), and the heater (30) is electrically connected to the first heater supply lead (31) and/or the second heater supply lead (32) via a plated through-hole (53) introduced in the insulation foil (44).

6. The sensor element as recited in one of the preceding claims, wherein the first heater supply lead (31) at least largely covers the full surface of the sensor element (10) in a supply region (25) and/or in the region of the heater (30).

7. The sensor element as recited in one of the preceding claims, wherein the first heater supply lead (31) is at a largely constant potential, such as earth potential, and, to heat the sensor element (10), the potential of the second heater supply lead (32) is able to be modified by electrical circuit elements arranged outside of the sensor element (10).

8. The sensor element as recited in one of the preceding claims, wherein the measuring device (22) includes at least one electrochemical cell having a first electrode (64), a second electrode (65) and a solid electrolyte (62), the solid electrolyte (62) electrically connecting the first and the second electrode (64, 65).

9. The sensor element as recited in one of the preceding claims,
wherein the first and/or the second heater supply lead (31, 32) are/is at least regionally implemented as lattice structure.

10. The sensor element as recited in one of the preceding claims,
wherein the perpendicular projection of the second heater supply lead (32) onto the plane of stratification of the first heater supply lead (31) lies at least regionally on the first heater supply lead (31).